MATIYKO, Nikolay Mikhaylovich; RADUNSKIY, Lev Davydovich; KHRENOV,
K.K., akademik, red.; SAPAROVA, A.L., red.; LARIONOV, G.Ye.,
tekhn.red.

[Expanded use of electric arc welding in the U.S.S.R., 1917-1960] Razvitie dugovoi elektrosvarki v SSSR, 1917-1960 gg. Pod red. K.K.Khrenova. Moskva, Gos.energ.izd-vo, 1960. 301 p. (MIRA 13:9)

1. Chlen-korrespondent AN SSSR; AN USSR (for Khrenov).
(Electric welding)

VLADIMIRSKIY, T.A., doktor tekhn.nauk; VROBLEVSKIY, R.V., inzh.; GLEBOV, L.V., inzh.; GODIN, V.M., kand.tekhn.nauk; GUZOV, S.G., inzh.; GULYAYEV, A.I., inzh.; YERSHOV, L.K., inzh.; KOCHANOVSKIY, N.Ya., kand.tekhn.nauk; LYUBAVSKIY, K.V., prof., doktor tekhn.nauk; PATON, B.Ye., akademik, prof., doktor tekhn.nauk; RABINOVICH, I.Ya., kand.tekhn.nauk; RADASHKOVICH, I.M., inzh.; RYKALIN, N.N., prof., doktor tekhn.nauk; SPEKTOR, O.Sh., inzh.; KHRENOV, K.K., akademik, prof., doktor tekhn.nauk; CHERNYAK, V.S., inzh.; CHULOSHNIKOV, P.L., inzh.; SHORSHOROV, M.Kh., kand.tekhn.nauk; BRATKOVA, O.N., prof., doktor tekhn.nauk, nauchnyy red.; ERINBERG, I.L., kand.tekhn.nauk, nauchnyy red.; GEL'MAN, A.S., prof., doktor tekhn.nauk, nauchnyy red.; KONDRATOVICH, V.M., inzh., nauchnyy red.; KRASOVSKIY, A.I., kand.tekhn.nauk, nauchnyy red.; SKAKUN, G.F., kand.tekhn.nauk, nauchnyy red.; SOKOLOV, Ye.V., inzh., red.; IVANOVA, K.N., inzh., red.izd-va; SOKOLOVA, T.F., tekhn.red.

[Welding handbook] Spravochnik po svarke. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry. Vol.1. 1960. 556 p. (MIRA 14:1)

1. AN USSR (for Paton, Khrenov). 2. Chleny-korrespondenty AN SSSR (for Rykalin, Khrenov).

(Welding--Handbooks, manuals, etc.)

30(7)

S/125/60/000/04/014/018
D003/D006

AUTHOR: Khrenov, K.K.

TITLE: XII Congress of the International Welding Institute

PERIODICAL: Avtomaticheskaya svarka, 1960, Nr 4, pp 88-94 (USSR)

ABSTRACT: The Congress was held at Opatija (Yugoslavia) and lasted from June 29 until July 5, 1959. Delegations from twenty-seven countries participated. The Soviet delegation was headed by K.K. Khrenov, Academician of the AN USSR (the AS UkrSSR), and included the following: Candidate of Technical Sciences M.P. Anuchkin (VNIIST); Engineer Ye.I. Berestovoy of MPS SSSR (MPS USSR); Candidate of Technical Sciences M.P. Bochay of MVTU imeni Baumana (MVTU imeni Bauman); Engineer K.P. Voshchakov (VNIIAVTOGEN (VNIIAVTOGEN); Engineer A.M. Gulyayev of Gor'kovskiy avto-

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XII Congress of the International Welding Institute

zavod (Gor'kiy Automobile Plant); Candidate of Technical Sciences L.N. Kushnarev (VNIIESO); Doctor of Technical Sciences A.N. Shashkov, Director of VNIIAVTOGEN; Candidate of Technical Sciences M.Kh. Shorshorov of the Institut metallurgii AN SSSR (Metallurgy Institute of the AS USSR); Candidate of Technical Sciences G. L. Petrov (LPI). After the congress the Soviet delegation visited the Shipbuilding Yard "imeni 3 May" at Rijeka and the "Ul'yanik" dockyard at Pula, where only hand arc-welding is used, and the "Metalno" Plant at Maribor, where metal frames for hydroconstructions, hoisting and transport equipment, and containers are made. In Zagreb they visited the "Elektrod" plant, where electrodes, welding transformers, machines for resistance welding and other

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XII Congress of the International Welding Institute

equipment are made and "Erlicon" presses for electrode coating are used, the "Litastroy" machine building plant and foundry, Electro-Mechanical Plant imeni Rade Konchar and a boiler plant. At Ljubljana, the delegation visited a welding institute which began full scale work in 1959. It occupies an area of approximately 1,500 m^2 and conducts research on welding plastics with hot tools. Welding engineers undergo a six-month course (licensed engineers only being admitted), and assistance is given to industrial enterprises on a contractual basis. The institute has a branch at Maribor. In Beograd, the delegation visited the University where there are about 40,000 students and Professor M. Radoykovich is in charge of the Chair of "Welding Engineering", a wel-

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XII Congress of the International Welding Institute

ding research institute for training instructors and welders, and a road bridge across the river Sava. The bridge's span is about 400 m, and it was arc-welded by hand.

ASSOCIATION: Institut elektrotekhniki AN USSR (Electrotechnical Institute of the AS UkrSSR)

Card 4/4

KHRENOV, K.K. [Khrienov, K.K.], akademik

In the struggle for technological progress. Nauka i
zhyttia 10 no.1:8-11 Ja '60. (MIRA 13:6)

L. AN USSR. Nachal'nik Otdela tekhnicheskikh nauk AN USSR.
(Ukraine--Research, Industrial)

YEREMEYEVA, S.I.; YAKOVLEV, V.B.; CHESNOVA, L.V.; SHLYKOVA, S.A.; KOZLOV, S.G.;
KHRENOV, K.K. (Kiyev); TIGRANYAN, S.T. (Yerevan); KROTIKOV, V.A. (Leningrad)

In the Soviet National Association of Historians of Science and Technology. Vop.ist.est.i tekh. no.10:180-187 '60. (MIRA 14:3)
(Scientific societies)

1.5400

89710

S/125/60/000/012/001/014
A161/A030

AUTHOR: Khrenov, K.K.

TITLE: Ceramic Fluxes for Automatic Arc Welding

PERIODICAL: Avtomaticheskaya svarka, 1960, No. 12, pp. 3 - 13

TEXT: The article presents the contents of a report read at a conference to mark the occasion of the 90th birth anniversary of Ye.O. Paton. At the moment the USSR industry uses almost exclusively fused fluxes. The "ceramic" fluxes are called by other names abroad - sintered, synthetic, bound, etc. The advantages of these fluxes are described, and the compositions of Soviet "ceramic" fluxes are given which had been developed at the Electric Engineering Institute AS UkrSSR and tested in practical use. Fluxes "K-1", "K-2", "K-4" and "K-11" are for low-carbon steel; "K-4" is recommended for particularly critical joints, i.e., where weld metal must be of top quality. "K-11" is destined for mass application, has no scarce components is not too sensitive to rust and dirt on metal, is good for welding frameworks in construction, in shipbuilding (cuts costs for preparatory cleaning). Fluxes КС-25ХГФА(KS-25KhGFA) КС-12Г2А (KS-12G2A), КС-30ХГСНА (KS-30KhG3NA), КС-12Н3 (KS-12N3), and "K-8" (Table 2) are for alloy steel; the "K-8" for welding austenitic

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Ceramic Fluxes for Automatic Arc Welding

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Ni-Cr steel with СВ -1Х18Н9Т (Sv-1Kh18N9T) wire. gives welds with high corrosion resistance. The other fluxes in Table 2 are for use with low-carbon electrode wire (the steel grades to be welded are included in the flux name). The fluxes in (Table 3), КС-Х12Т (KS-Kh12T), КС-Х12М (KS-Kh12M), КС-Р9Р (KS-R9R), КС-3Х2В8 (KS-3Kh2V8), КС-Х14Р (KS-Kh14R) are for surfacing work (the steel grade for which the flux is suited is included in the flux designation). Ceramic fluxes can be made magnetic by adding magnetic material; such powder flux sticks on magnets and on electric wires passing sufficiently strong electric current. Ferroalloys are not sufficiently ferromagnetic; it is recommended to add 20% (weight) of commercially pure iron powder. It is supposed that ferrites are also suitable. Special welding nozzles for magnetic flux are illustrated (Figs. 3,4,5). It is mentioned that satisfactory results have been obtained with ceramic fluxes in welding copper and nickel. [Abstracter's note: No details on these applications are included]. A large special plant shop is under construction in the USSR (place not indicated) for the production of ceramic fluxes. They are expected to come into extensive use. There are 5 tables and 5 figures

ASSOCIATION: Institut elektrotekhniki AN USSR (Electric Engineering Institute of the Ukrainian Academy of Sciences)
SUBMITTED: September 17, 1960
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Ceramic Fluxes for Automatic Arc Welding
Table 1:

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Таблица 1

Керамические флюсы для сварки малоуглеродистой стали

Вещестно	Химический состав флюсов, %			
	Марка флюса			
	К-1	К-2	К-4	К-11
SiO_2	14,0—16,0	14,3—16,3	8,0—10,0	25,4—32,9
TiO_2	18,0—25,0	21,0—30,0	—	—
MnO_2	—	—	—	48,0—54,0
FeO	17,0—25,0	20,0—29,0	—	—
$CaCO_3$	—	—	42,0—46,0	—
MgO	—	—	17,0—19,0	—
CaF_2	9,2—9,9	9,2—9,9	11,0—12,0	9,2—9,9
Al_2O_3	3,5—5,0	3,5—5,0	—	—
Na_2O	2,5—3,5	2,2—3,0	1,5—2,0	1,8—2,2
Mn	11,0—13,0	11,0—13,0	2,5—2,8	—
Si	11,0—12,0	5,7—6,3	1,7—1,9	7,2—7,8
Ti	—	—	0,8—1,0	—
Al	—	—	1,6—1,9	—
Fe	4,0—7,0	2,4—5,0	6,0—8,0	2,2—2,8
S и P каждого	До 0,15	До 0,15	До 0,10	До 0,15
Прочие	До 3,0	До 3,0	До 3,0	До 3,0

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Ceramic Fluxes for Automatic Arc Welding
Table 1 continued:

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Состав шихты флюсов, %

Компоненты	К-1	К-2	К-1	К-11
Титановый концентрат	48,0	55,0	—	—
Полевой шпат	13,0	13,0	—	—
Плавиковый шпат	10,0	10,0	13,0	10,0
Мрамор	—	—	48,1	—
Магнезитовый кирпич	—	—	20,0	—
Кварцевый песок	—	—	5,0	20,0
Марганцевая руда	—	—	—	60,0
Ферромарганец (Мн-0)	14,0	14,0	3,5	—
Ферросилиций (Си-75)	15,0	8,0	2,4	10,0
Ферротитан (Ти-0)	—	—	5,0	—
Ферроалюминий (Al∼50%)	—	—	3,0	—
Жидкое стекло, плотность 1,3—1,35, в % веса смеси	15,0	13,0	22,0	19,0

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Ceramic Fluxes for Automatic Arc Welding

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Table 2:

Таблица 2

Керамические флюсы для сварки легированных сталей

Вещество	Химический состав флюсов, %				
	Марка флюса				
	КС-25ХГФА	КС-12Г2А	КС-30ХГСНА	КС-12Н3	К-8
$CaCO_3$	47,0—51,0	48,0—52,0	54,0—48,0	49,0—58,8	54,0—58,0
TiO_2	14,5—15,0	14,5—15,0	14,5—15,0	14,5—15,0	14,5—15,0
CaF_2	18,4—19,8	18,4—19,8	18,4—19,8	18,4—19,8	5,0—6,0
SiO_2	4,0—5,5	4,0—5,5	4,0—5,5	4,0—5,5	4,0—6,0
MgO	—	—	—	—	8,5—11,0
Al_2O_3	—	—	—	—	4,5—5,0
Na_2O	1,5—1,9	1,5—1,9	1,5—1,9	1,5—1,9	1,5—2,0
Mn	1,1—1,3	3,6—4,3	1,3—1,6	0,6—0,8	—
Si	2,3—2,7	1,5—1,7	3,2—3,5	0,8—1,1	3,6—3,9
Cr	1,3—1,8	—	1,3—1,7	—	—
Ni	—	—	1,5—1,6	3,8—4,0	—
V	0,17—0,27	—	—	—	—
C	—	—	0,30—0,35	—	—
Ti	1,7—1,2	1,0—1,2	1,0—1,2	1,2—1,6	—
Al	0,1—0,3	0,1—0,3	0,1—0,3	0,1—0,4	—
F	5,7—7,7	5,0—6,3	5,0—7,0	4,7—5,3	1,1—1,4
S	До 0,1	До 0,1	До 0,1	До 0,1	До 0,1
P	До 0,1	До 0,1	До 0,1	До 0,1	До 0,1
Прочие	До 1,0	До 1,0	До 1,0	До 1,0	До 1,0

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Ceramic Fluxes for Automatic Arc Welding
Table 2 continued:

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Компоненты	Состав шихты флюсов, %				
	КС-25ХГФА	КС-12Г2А	КС-30ХГСНА	КС-12ГН3	К-8
Мрамор	53,9	54,5	51,1	53,0	59,0
Плавиковый шпат	20,0	20,0	20,0	20,0	6,0
Двуокись титана	15,0	15,0	15,0	15.0	15,0
Магнезитовый кирпич	—	—	—	—	10,0
Глинозем	—	—	—		5,0
Ферромарганец (Мн-0)	1,4	4,5	1,7	0,8	—
Ферросилиций (Си-75)	3,2	2,0	4,5	1,2	5,0
Феррохром (Хр-0)	2,0	—	—	—	—
Феррохром (Хр-6)	—	—	1,9	—	—
Никель металлический	—	—	1,6	4,0	—
Феррованадий (Вд-1)	0,5	—	—	—	—
Ферротитан (Ти-0)	4,0	4,0	4,0	6,0	—
Графит	—	—	0,2	—	—
Жидкое стекло плотность 1,30—1,35, в % общего веса смеси	20,0	20,0	20,0	22,0	20,0

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Ceramic Fluxes for Automatic Arc Welding

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Table 3:

Таблица 3

Керамические флюсы для наплавочных работ

Химический состав флюсов, %

Вещество	Марка флюса				
	КС-Х12Т	КС-Х12М	КС-Р9Р	КС-3Х2В8	КС-Х14Р
$CaCO_3$	40,0—43,0	38,0—42,0	31,5—33,5	40,0—43,0	37,0—40,0
CaF_2	5,0—6,0	5,0—6,0	8,0—10,0	8,0—9,5	8,0—10,0
TiO_2	5,0—6,0	5,0—6,0	8,0—9,0	13,5—14,5	—
SiO_2	8,6—10,0	8,6—10,0	4,0—5,5	3,0—5,0	8,6—10,0
Na_2O	1,5—1,7	1,5—1,7	1,4—1,6	1,5—2,0	1,5—1,7
MgO	—	—	—	—	12,0—14,0
Mn	—	—	—	0,7—1,0	—
Si	До 0,7	До 0,7	До 0,7	2,0—2,5	До 2,4
Cr	16,5—18,0	16,5—18,0	4,9—6,2	3,0—3,6	17,0—18,5
Mo	—	0,8—1,4	—	—	—
V	—	—	4,0—5,5	0,4—0,7	—
W	—	—	13,5—15,0	10,0—12,0	—
Ti	3,5—4,0	3,5—4,0	0,7—1,0	1,0—1,5	—
Al	0,7—1,1	0,7—1,1	0,6—0,9	0,2—0,3	—
Fe	14,0—19,0	14,0—19,0	17,0—20,0	10,0—14,0	7,0—10,0
C	2,5—3,0	2,0—2,4	1,5—1,8	0,40—0,55	2,0 · 2,3
BC	—	—	0,4	—	2,8—3,0
S	До 0,1	До 0,1	До 0,15	До 0,1	До 0,1
P	До 0,1	До 0,1	До 0,15	До 0,1	До 0,1

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Ceramic Fluxes for Automatic Arc Welding

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Table 3 continued:

Состав шихты флюсов, %

Компоненты	КС-Х12Т	КС-Х12М	КС-Р9р	КС-3Х2В8	КС-Х14Р
Мрамор	43,9	41,5	35,6	43,0	39,5
Плавиковый шпат	6,0	6,0	10,0	10,0	10,0
Двуокись титана	6,0	6,0	9,0	15,0	5,0
Кварцевый песок	5,0	5,0	—	—	—
Магнезитовый кирпич	—	—	—	—	14,0
Феррохром (Хр-6)	24,0	24,0	8,0	5,0	25,0
Ферромолибден (Мо-3)	—	20	—	—	—
Ферротитан (Ти-2)	14,0	14,0	5,0	5,0	—
Ферровольфрам (В-3)	—	—	20,0	17,0	—
Феррованадий (Вд-2)	—	—	10,0	1,0	—
Ферроалюминий (Al≈50%)	—	—	1,0	—	—
Ферромарганец (Мн-2)	—	—	—	1,0	—
Ферросилиций (Си-75)	—	—	—	3,0	—
Графит	1,1	0,5	1,0	—	3,0
Карбид бора	—	—	0,4	—	0,5
Жидкое стекло, плотность 1,30, в % общего веса смеси	17,0	17,0—18,0	17,0—18,0	17,0—18,0	3,0 17,0—18,0

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Ceramic Fluxes for Automatic Arc Welding

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Table 1:

Ceramic fluxes for low-carbon steel.

Lower part of table gives the flux mix components (from top to bottom) Titanium concentrate; feldspar; fluorspar; marble; magnesite brick; quartz sand; manganese ore; ferromanganese Мн-0 grade (Mn-0); ferrosilicon Си-75 grade (Si-75); ferrotitanium Ти-0 (Ti-0); ferroaluminum (Al≈50%); water glass with 1.3 - 1.35 density (% of mix weight).

Table 2:

Ceramic fluxes for alloy steel; the mix components (lower part of table):

marble; fluorspar; titanium dioxide; magnesite brick; alumina; ferromanganese (Mn-0); ferrosilicon (Si-75); ferrochrome Хр-0 (Khr-0): ferrochrome Хр-6 (Khr-6); metallic nickel; ferrovanadium Вд-1 (Vd-1), ferrotitanium Ти-0 (Ti-0); graphite; water glass of 1.30 - 1.35 (density (% of mix weight).

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Ceramic Fluxes for Automatic Arc Welding

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Table 3:

Ceramic fluxes for surfacing;

the components (bottom part of table):
Marble; fluorspar; titanium dioxide; quartz sand; magnesite brick; ferrochrome Хр-6 (Khr-6); ferromolybdenum Мо-3 (Mo-3); ferrotitanium Ти-2 (Ti-2); ferrotungsten В-3 (W-3); ferrovanadium Вд-2 (Vd-2); ferroaluminum (Al≈50%); ferromanganese Мн-2 (Mn-2); ferrosilicon Си-75 (Si-75); graphite; boron carbide; water glass with 1.30 density (% of mix weight).

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Ceramic Fluxes for Automatic Arc Welding

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A161/A030

Figure 3:
Torch for magnetic flux: 1 - magnetic flux; 2 - - permanent magnet; 3 - - current conducting pipe; 4 - welding wire; copper bushing.

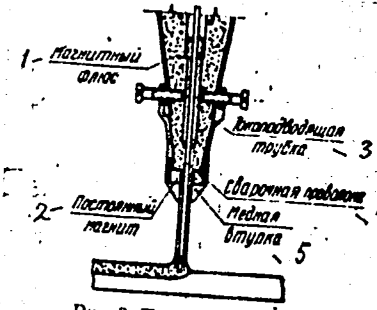

Рис. 3. Применение магнитного флюса.

Figure 4:
Semiautomatic welding with magnetic flux in position from top.

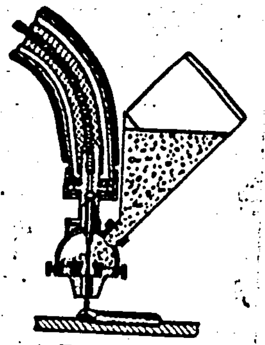

Рис. 4. Полуавтоматическая сварка с магнитным флюсом в нижнем положении.

Figure 5:
Semiautomatic welding with magnetic flux in vertical position.

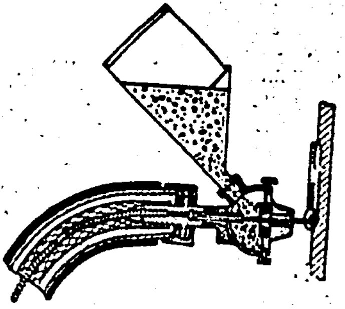

Рис. 5. Полуавтоматическая сварка с магнитным флюсом в вертикальном положении.

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FAL'KEVICH, A.S.; KHRENOV, K.K.

New movable diesel generators for welding pipelines. Avtom. svar. 13 no.9:58-61 S '60. (MIRA 13:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.
(Electric welding--Equipment and supplies)
(Pipelines--Welding)

KHRENOV, K.K.[Khienov, K.K.], akademik, otv. red.; DANILEVSKIY, V.V. [Danylevs'kyi,V.V., deceased], red.; BELYANKIN, F.P. [Bieliankin, F.P.], red.; DOBROKHOTOV, M.M., red.; PATON, B.Ye., red.; SUKHOMEL, G.Y.[Sukhomel, H.I.], red.; SHVETS', I.T., red.; KUCHEROV, P.S., red.; NESTERENKO, A.D., red.; POKHODZILO, P.V., red. izd-va; YEFIMOVA, M.I., tekhn. red.

[From the history of institutes of the Department of Technology] Narysy z istorii instytutiv viddilu tekhnichnykh nauk. Kyiv, Vyd-vo Akad. nauk URSR, 1961. 167 p. (MIRA 15:7)

1. Akademiya nauk URSR, Kiev, Komisiia z istorii tekhniky.
2. Chlen-korrespondent Akademii nauk USSR (for Kucherov).
3. Akademiya nauk USSR (for Khrenov).

(Academy of Sciences of the Ukrainina S.S.R.]

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PHASE I BOOK EXPLOITATION SOV/5911

Khrenov, Konstantin Konstantinovich, and Daniil Matveyevich Kushnerev

Keramicheskiye flyusy dlya avtomaticheskoy svarki i naplavki (Ceramic Fluxes for Automatic Welding and Facing) Kiyev, Gostekhizdat UkrSSR, 1961. 262 p. 4000 copies printed.

Ed.: A. Novik; Tech. Ed.: L. Gorkavenko.

PURPOSE: This book is intended for technical personnel and scientific research workers. It may also be useful to students at schools of higher technical education and tekhnikums training specialists in welding.

COVERAGE: Results of the study of new ceramic [unfused] fluxes and their related type, the magnetic fluxes, are presented. The use of these fluxes in various branches of industry for welding carbon and alloy steels (including stainless steels) is reviewed. Attention is also given to the hardfacing of metallurgical equipment parts, cutting tools, and dies and to the composition of fluxes and their manufacture. Chapter VII was written by Yu. A. Yuzvenko, who also participated in writing the second part of Chapters II and IX. Chapter VIII was

Card 1/[illegible]

written by K. V. Bagryanskiy, Candidate of Technical Sciences. The authors thank M. P. Grebel'nik and I. V. Lyakhova, scientific research workers, V. M. Kiryakov and V. G. Svetsinkiy, Engineers, and A. N. Metel'skiy, V. A. Kovalevskiy, and B. F. Narynskiy for their assistance. There are 94 references, mostly Soviet.

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Ch. II. Metallurgical Processes in Welding Under a Ceramic Flux 21
1. Deoxidation of the deposited metal 21
2. Alloying of the melting pool 25
3. Modification of the deposited metal 32
4. Some specific features of processes in the gaseous phase 40

PATON, Yevgeniy Oskarovich; SAVIN, G.N., akademik, otv. red.; DOBROKHOTOV, N.N., akademik, red.; KHRENOV, K.K., akademik, red.; BELYANKIN, F.P., akademik, red.; PATON, B.Ye., akademik, red.;REMENNIK, T.K., red.; KADASHEVICH, O.A., tekhn. red.

[Selected works; in three volumes] Izbrannye trudy; v trekh tomakh. Kyiv, Izd-vo Akad. nauk USSR. Vol.2. [Welded structures] Svarnye konstruktsii. 1961. 418 p. (MIRA 14:8)

1. Akademiya nauk Ukrainskoy SSR (for Savin, Dobrokhotov, Khrenov, Belyankin, Paton,B.Ye.)

(Structural frames—Welding)

BORT, M.M., kand.tekhn.nauk; BYALOTSKIY, L.A., inzh.; VASIL'YEV, G.V., inzh.; VOSHCHANOV, K.P., inzh.; GAPCHENKO, M.N., kand.tekhn.nauk; GORPENYUK, N.A., kand.tekhn.nauk; GREBEL'NIK, P.G., kand.tekhn.nauk; DYATLOV, V.I., kand.tekhn.nauk; TROCHUN, I.P., kand.tekhn.nauk; KHRENOV, K.K., akademik; SOROKA, M.S., red.

[Electric welder's handbook] Spravochnik elektrosvarshchika. Izd.3., perer. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1961. 748 p. (MIRA 14:6)

1. AN USSR (for Khrenov).
(Electric welding)

KHRENOV, K.K., akademik; KHOMENKO, I.Z., inzh.

Percussion condenser discharge welding of balls to fountain pen tips. Svar. proizv. no.5:23-25 My '61. (MIRA 14:4)

1. Institut elektrotekhniki AN USSR. 2. Akademiya nauk USSR (for Khremov).

(Electric welding)

KHRENOV, K.K., akademik

Refinement of the Saha equation. Svar. proizv. no.9:1-4
S '61. (MIRA 14:8)

1. AN USSR.
(Electric discharges through gases)

S/135/61/000/012/008/008
A006/A101

AUTHORS: Khrenov, K. K., Sheynkin, M. Z., Shipov, K. N., Engineers

TITLE: On techniques for the high-speed filming of a welding arc

PERIODICAL: Svarochnoye proizvodstvo, no. 12, 1961, 34-35

TEXT: For the high-speed filming of a welding arc, the authors suggest a method, replacing the "shadow" method, when light is thrown upon the arc from the side opposite to the camera. The authors propose to illuminate the arc intensively from both the camera and the opposite side. This method yields a more distinct three-dimensional image of the welding arc, the electrode and the molten metal drop. The front illumination of the arc is performed with two carbon-arc КПД-25 (KPD-25) projectors, power-supplied with 150 amps current each. The illumination from the opposite side is made with a 10-kw electric lamp; the light beams are focused on the electrode by a system of lenses; a dark red КС-17 (KS-17) filter is placed before the lens. A СКС-1 (SKS-1) camera with "Industar-55" lens (F = 300 mm) is employed. For the purpose of establishing volt-ampère characteristics of the arc and of determining the dependence of arc voltage on its length, and the nature of metal transfer,

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On techniques for the high-speed filming ...
S/135/61/000/012/008/008
A006/A101

high-speed filming is synchronized with current and arc voltage oscillographing. For this purpose a special circuit was developed which serves to close the time relay contacts, which switch-on the camera and the oscillograph when the "Start" button is pressed. Difficulties of synchronization are facilitated by the following operation: an oscillograph vibrator is switched on with the aid of contacts and registers the sinusoid of the alternating current. There are 3 figures and 4 Soviet-bloc references.

Card 2/2

SILIN, Lev Leonidovich; BALANDIN, Gennadiy Fedorovich; KOGAN, Moisey Grigor'yevich; KHRENOV, K.K., retsenzent; OSHCHEPKOV, P.K., doktor tekhn.nauk, retsenzent; RYKALIN, N.N., red.; CHERNYAK, O.V., red.; MODEL', B.I., tekhn.red.

[Ultrasonic welding; joining metals in the solid state and improving the quality of weld joints] Ul'trazvukovaia svarka; soedinenie metallov v tverdom sostoianii i uluchshenie kachestva svarnykh shvov. Pod red. N.N.Rykalina. Moskva, Mashgiz, 1962. 251 p. (MIRA 15:4)
(Ultrasonic welding)

37406

S/135/62/000/005/002/007
A006/A101

1.1100

AUTHORS: Khrenov, K. K., Academician of AS UkrSSR, Esibyan, E. M., Engineer

TITLE: The effect of static characteristics of the arc and power supply source on the stability of arc burning and conditions

PERIODICAL: Svarochnoye proizvodstvo, no. 5, 1962, 10 - 13

TEXT: The authors suggest a new conception of the stability of arc conditions and new welding characteristics of arc conditions. The effect of the static characteristics of the source and the arc on stable burning and conditions of the arc are analyzed without taking into account their dynamic characteristics. It was found that the "source-arc" system can be stable in both positive and negative self-alignment, if a regulator is introduced to the power supply source. Stable arc conditions, i.e. a constant fusion effect of the arc upon the metal during oscillations of its length, can be ensured by the "source-arc" system in welding with both consumable and nonconsumable electrodes. In welding with consumable electrode, a necessary condition for a stable arc system is the positive self-alignment of the "source-arc" system; in welding with a non-consumable

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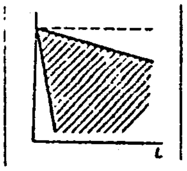
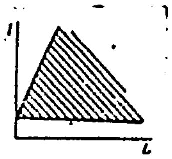
A006/A101

The effect of...

electrode, negative self-alignment is required. The degree of stability of the arc conditions is determined by the slope of the characteristic of arc conditions $I = f(L)$, i.e. by the coefficient of self-alignment of the "source-arc" system (K_S). General conditions for stable arc burning and system are given in the table below:

Electrode type	Requirement to the "source-arc" system	Conditions of stable arc burning	Conditions of a stable arc system	Characteristic range of arc system
Consumable	Positive self-alignment	The system is stable without a regulator	$K_S > 0$ $K_{S.o} = \frac{1}{K_{s.T} T_o}$ $\rho_{u.o} = \rho_{\partial} - E_{\partial} K_{s.T} T_o$ *)	
Non-consumable	Zero or negative self-alignment	The system is stable with a regulator	$K_s \leqslant 0$ $K_s = K_{s.o}$ $\rho_{u.o} = \rho_{\partial} - \frac{E_{\partial}}{K_{s.o}}$ *)	

Card 2/3

S/135/62/000/005/002/007
A006/A101

The effect of...

*) $\rho_{u.o}$ - is the optimum inclination; E_{∂} - is the gradient of the arc column in v/mm; $K_{s.T}$ - is the coefficient of self-alignment of the arc by the current; T_o - is the time of self-alignment. As an example the authors present the circuit diagram of a device developed at the Institute of Electric Engineering, AS UkrSSR, for the parametric stabilizing of arc current with the aid of a semiconductor triode, connected in series to the arc and the d-c power supply source. (Authors' Certificate no. 134357 in the name of A. N. Milyakh, K. K. Khrenov, E. M. Esibyan and Yu. I. Drabovich with priority of April 11, 1960). There are 6 figures and 1 table.

ASSOCIATION: Institut elektrotekhniki AN USSR (Institute of Electric Engineering, AS UkrSSR)

Card 3/3

KHRENOV, K.K., akademik

More on refining the Saha equation. Svar. proizv. no.6:1-2 Je '62. (MIRA 15:6)

1. Akademiya nauk Ukrainskoy SSR i Institut elektrotekhniki AN USSR.
(Electric discharges through gases)

SHEYNKIN, M.Z.; KHRENOV, K.K.

Some characteristics of the glowing of the arc and metal transfer in welding with a consumable electrode in a water vapor medium. Avtom. svar. 15 no.9:40-46 S '62. (MIRA 15:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.

(Electric welding--Equipment and supplies)

FAL'KEVICH, A.S., kand.tekhn.nauk; KHRENOV, K.K., inzh.

Development and study of lightweight welding conductors. Mont. i spets. rab. v stroi. 24 no.8:11-13 Ag '62. (MIRA 15:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.
(Electric welding)

KHRENOV, Konstantin Konstantinovich [Khrienov, K.K.]; GNYP, Pavel Ivanovich [Hnyp, P.I.]; CHEPUR, N.D., red. izd-va; TURBANOVA, N.A., tekhn. red.

Viktor Vasyl'ovych Danylevs'kyi. Kyiv, Vyd-vo AN Ukr. RSR, 1963. 42 p. (MIRA 16:10)
(Danilevskii, Viktor Vasil'evich, 1898-1960)

KHRENOV, K.K., akademik, otv. red.; BORYAKIN, V.N., red.izd-va;
YAKHNIS, R.Yu., tekhn. red.

[Problems in the history of science and technology]Problemy istorii nauki i tekhniki. Kiev, Izd-vo Akad. nauk USSR, 1963. 138 p. (MIRA 16:4)

1. Akademiya nauk URSR, Kiev. Sektor istorii tekhniki i yestestvoznaniya. 2. Akademiya nauk Ukr.SSR (for Khrenov).
(Science) (Technology)

KHRENOV, K.K., akademik, otv. red.; REMENNIK, T.K., red.;
TURBANOVA, N.A., tekhn. red.

[Welding of special metals and alloys] Svarka spetsial'nykh metallov i splavov. Kiev, Izd-vo AN USSR, 1963. 151 p. (MIRA 17:2)

1. Akademiya nauk URSR, Kiev. Instytut elektrosvarki.
2. Akademiya nauk Ukr.SSR (for Khrenov).

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S/135/63/000/001/003/016
A006/A101

/ 2300

AUTHORS: Khrenov, K. K., Academician of AN UkrSSR, Shestakov, A. I., Engineer

TITLE: On plastic deformation in pressure butt welding

PERIODICAL: Svarochnoye proizvodstvo, no. 1, 1963, 11 - 12

TEXT: It is proposed to determine plastic deformation in cold and pressure butt-welding from the volume of the extruded metall (burr). The metal cut-off during welding is weighed and the value obtained is divided by the specific metal weight. The proposed method is illustrated by examples which show that the notion of the "deformation degree" should be replaced by the term "deformation value", which can be experimentally determined. Butt welding should be performed with optimum deformation value. It is the decisive factor of the process: lower deformation reduces the strength and ductility of the weld and increased deformation raises the metal consumption. There are 4 figures.

ASSOCIATION: Institut elektrotekhniki AN UkrSSR (Institute of Electric Engineering, AS UkrSSR)

Card 1/1

KHRENOV, K.K.

Cold welding of metals. Avtom. svar. 16 no.8:4-11 Ag '63.
(MIRA 16:8)

1. Institut elektrosvarki imeni Ye.O. Patona AN UkrSSR.
(Cold welding)

L 14477-65 EWT(m)/EPR/EWA(d)/EWP(t)/EWP(b) Ps-4 AEDC(a)/ASD(m)-3/AFTC(p)
JD/WB
ACCESSION NR: AT4012857 S/3069/63/000/000/0009/0021

AUTHOR: Khrenov, K. K.

14 27

TITLE: Cold and pressure welding of aluminum and aluminum alloys

SOURCE: Svarka spetsial'ny*kh metallov i splavov. Kiev, Izd-vo AN UkrSSR, 1963, 9-21

TOPIC TAGS: aluminum, aluminum alloy, aluminum welding, welding, cold welding, pressure welding, alloy welding

ABSTRACT: The advent of light metals (aluminum and its alloys) as industrial materials is discussed, and some Soviet achievements in the field of cold welding of these materials are specified. The data presented on cold welding were obtained chiefly at the Institut elektrotekhniki Akademii nauk Ukrainskoy SSR (Electrotechnical Institute, Academy of Sciences of the Ukrainian SSR). Cold spot, seam, butt, and shear welding are discussed in detail, as well as welding tools developed and now mass produced in the USSR — notably the KS-6 portable hand welder which permits aluminum-to-copper wire welding. Pressure welding (i.e., cold welding with preheating) and regular cold welding, which are both productive and economical, are found to be greatly superior to hot welding in joint quality and in the homogeneity and purity of the weld, which results in higher corrosion resistance.

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18

L 14477-65
ACCESSION NR: AT4012857

0

Among the most promising prospective users of this type of welding are power installations and the construction and aircraft industries. Orig. art. has: 12 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00

SUB CODE: MM NO REF SOV: 000 OTHER: 000

Card 2/2

ACCESSION NR: AP4020101 S/0125/64/000/003/0034/0036

AUTHOR: Khrenov, K. K. (Corresponding member); Balakin, V. I. (Engineer)

TITLE: Dilatometric investigation of aluminum, copper, and titanium butt joints made by cold welding

SOURCE: Avtomaticheskaya svarka, no. 3, 1964, 34-36

TOPIC TAGS: welding, cold welding, aluminum cold welding, copper cold welding, titanium cold welding, butt cold welding

ABSTRACT: An experimental investigation of linear-expansion coefficients of Al and Cu 10-mm^2 electric-conductor wires and 3-mm-diameter VT1 commercially pure titanium wire is reported. Cold welding was performed with 1, 2, and 3 upsettings with a stroke equal to the wire diameter. Dilatometric curves were obtained on a differential optical dilatometer, and the linear-expansion coefficients were determined from the curves for 100-400C (Al) and 100-500C (Cu

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ACCESSION NR: AP4020101

and Ti) ranges; at 400C, the coefficient for Al was determined as 30×10^{-6} per 1C. It was found that, within the recrystallization temperature range, the linear-expansion coefficient of wire joints is somewhat lower than that of solid wire. The linear expansion of cold-welded joints was found to be dependent on the processes transpiring in the deformed metal during subsequent heating. It is also inferred that a variation of interatomic bonds in cold-welded joints does not necessarily take place. Orig. art. has: 2 figures.

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona AN UkrSSR (Institute of Electric Welding, AN UkrSSR); Kiyevskiy institut grazhdanskogo vozdushnogo flota (Kiev Institute of Civil Aviation)

SUBMITTED: 03Jul63 DATE ACQ: 31Mar64 ENCL: 00

SUB CODE: ML NO REF SOV: 006 OTHER: 001

Card 2/2

KHRENOV, K.K. [Khrienov, K.K.], akademik; BALAKIN, V.I.

Role of texturation in the cold welding of metals. Dop. AN URSR no.8:1075-1076 '64. (MIRA 17:8)

1. Institut elektrosvarki AN UkrSSR. 2. AN UkrSSR (for Khrenov).

KHRENOV, K.K., akademik, otv. red.; SHVETS', I.T., red.; SHCHERBAN', O.N., red.; KUCHEROV, P.S., red.; SAMSONOV, G.V.[Samsonov, H.V.], red.; ANISIMOV, Yu.O., kand. tekhn. red.; DOBROV, G.M.[Dobrov, H.M.], kand. tekhn. nauk, red.; MATIYKO, M.M., red.; ORLIK, O.L.[Orlyk, O.L.], red.

[Essays on the history of technology in the Ukraine] Narysy z istorii tekhniky na Ukraini. Kyiv, Naukova dumka, 1964. 110 p. (MIRA 17:11)

1. Akademiya nauk URSR, Kiev. Sektor istorii tekhniki i yestestvovaniya. 2. Chlen-korrespondent AN Ukr.SSR (for Kucherov, Samsonov).

NAZAROV, S.T.; KHRENOV, K.K., akademik, retsenzent

[Methods of controlling the quality of welded joints]
Metody kontrolia kachestva svarnykh soedinenii. Moskva,
Mashinostroenie, 1964. 227 p. (MIRA 18:4)

1. Akademiya nauk Ukr.SSR (for Khrenov).

KHRENOV, K.K.

Present status of the cold welding of metals. Avtom. svar. 17 no.5:1-3 My '64.
(MIRA 17:11)

1. Institut elektrosvarki imeni Patona AN UkrSSR.

L 34940-65 EPA(s)-2/EWT(m)/EPR/T/EWP(v)/EWP(k)/EWP(b)/EWA(c)/EWP(t) IJP(c) JD/HM

ACCESSION NR: AP5007349 S/0125/65/000/003/0021/0022

AUTHOR: Khrenov, K. K. (Corresponding member AN UkrSSR); Gurskiy, P. I. (Candidate of technical sciences); Balakin, V. I. (Engineer)

TITLE: Cold welding of dissimilar metals 27

24

SOURCE: Avtomaticheskaya svarka, no. 3, 1965, 21-22 B

TOPIC TAGS: welding, cold welding, dissimilar metal welding 18

ABSTRACT: Dissimilar metals, such as titanium and copper, aluminum and lead, and copper and lead, can be joined by the cold-welding method suggested by K. K. Khrenov (Author Certificate No. 116061, 22 November 1958). In this method, one of the metals to be joined is provided with wedge-shaped projections and the other with corresponding recesses (see Fig. 1 of the Enclosure). Experiments showed that the best joint quality is obtained by putting the projections on the softer metal and by using a wedge angle of approximately 7°. Satisfactory quality joints between aluminum and lead or copper and lead can be produced despite the difference in the atom diameters, which amounts

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L 34940-65

ACCESSION NR: AP5007349

5

to 22% in the case of aluminum and lead, and to 36% in the case of copper and lead. The strength of the weld between titanium and copper equals that of copper. Temperatures up to 400C have little or no effect on the joint strength; those above 400C lower the strength, which is apparently caused by formation of intermetallic compounds in the weld zone. Orig. art. has: 4 figures. [ND]

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona, ANUkrSSR (Electric Welding Institute, AN UkrSSR)

SUBMITTED: 17Oct63 ENCL: 01 SUB CODE: MM

NO REF SOV: 001 OTHER: 001 ATD PRESS: 3211

Card 2/3

L 34940-65

ACCESSION NR: AP5007349 ENCLOSURE: 01

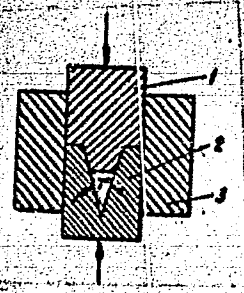

Fig. 1. Cold-welding method

1 - Copper; 2 - titanium;
3 - bushing.

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L 4505-66 EWT(1)/EWT(m)/ETC/EPF(n)-2/EWG(m)/EWP(v)/EPA(w)-2/T/EWP(t)/EWP(k)/EWP(b)/

ACC NR: AP5021962 EWA(c) IJP(c) JD/HM/AT UR/0021/65/000/008/1050/1052

44,55 44,55

AUTHOR: Lyeskov, H. I. (Leskov, G. I.); Khryenov, K. K. (Khrenov, K. K.)(Academician AN UkrRSR)

TITLE: Processes occurring around a "cold" arc-discharge cathode 21,44,55

SOURCE: AN UkrRSR, Dopovidi, no. 8, 1965, 1050-1052

TOPIC TAGS: arc discharge, cold cathode, field emission, stimulated emission

ABSTRACT: Processes in an arc discharge, particularly on "cold" electrodes, the material of which boils at temperatures insufficient for appreciable thermionic emission, are considered from a new point of view. The existing theories of the electron emission of cold cathodes are criticized for failing to explain some observed phenomena. The positive ion, on approaching the cathode to within 10^{-7} cm, produces near the cathode surface a microfield which destroys the potential barrier, permitting one of the electrons to tunnel its way to the ion. The excited atom produced thereby continues its inertial motion to the cathode. Because of the high energy density of the cathode spot region almost all the atoms radiate photons by stimulated emission. It is pointed out that the cathode spot is a source of coherent radiation of several frequencies. An approximate consideration of the energy balance indicates that about half of the energy supplied to the cathode is used up in melting and evaporation of the cathode material, while the other half covers all the other losses in the cathode region.

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L 4566-66

ACC NR: AP5021962

This rough calculation is in agreement with experimental data for arc welding with a steel electrode. Orig. art. has: 4 formulas.

ASSOCIATION: Instytut elekrozvaryuvannya AN URSR [institut elektrosvarki AN UkrSSR] (Electric Welding Institute, AN UkrSSR) 44,55

SUBMITTED: 12Feb65

ENCL: 00

SUB CODE: EM

NR REF SOV: 001

OTHER: 004

Card 2/2

KHRENOV, K.K. [Khrienov, K.K.], akademik

Academician Viktor Vasil'evich Danilevskii, 1898–. Dop. AN URSR no.9:1251-1252 '65. (MIRA 18:9)

1. AN UkrSSR.

L 3461-66 EWT(l)/EWT(m)/ETC/EPF(n)-2/EWG(m)/EWP(v)/EPA(w)-2/T/EWP(t)/EWP(k)/EWP(b)/ EWA(c) IJP(c)

ACCESSION NR: AP5017206 JD/HM/AT UR/0020/65/162/006/1271/1272

AUTHORS: Leskov, G. I.; 44,55 Khrenov, K. K. 44,55

54
50
B

TITLE: Processes occurring at 'cold' cathodes of an arc discharge

SOURCE: AN SSSR. Doklady, v. 162, no. 6, 1965, 1271-1272 21,44,55

TOPIC TAGS: electric arc, arc property, cold cathode

ABSTRACT: After mentioning briefly earlier attempts to explain the causes of electron emission from cold cathodes, the material of which boils at temperatures which are insufficient for appreciable thermionic emission (mercury, aluminum, copper, iron, and others), the authors propose to apply to the cathode region of the arc Einstein's theory of induced radiation of atoms, and show that the results are in better agreement with experiment. It had been previously assumed that the excited atoms which move in the arc towards the cathode were incapable of emitting photons. It is shown, however, that the current densities prevailing near the cathodes are such that induced radiation is possible, and this induced radiation is absorbed by the neutral gas,

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ACCESSION NR: AP5017206

4

causing the latter to become excited and ionized. This in turn produces a new generation of ions and electrons, which carry the current into the arc column. The energy balance of this process is analyzed and it is shown that the induced radiation and formation of arcs at cold cathodes becomes feasible once a certain initial ion current is produced. For example, the minimum current to produce an arc from a steel cathode is 4 amperes. Orig. art. has: 5 formulas

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona Akademii nauk UkrSSR (Institute of Electric Welding, Academy of Sciences UkrSSR) 44,5

SUBMITTED: 22Jan65 14 ENCL: 00 SUB CODE: GP, EE

NR REF SOV: 002 OTHER: 003

BVK
Card 2/2

KHRILEV, L.S.

Dependence of the power of gas-turbine units on the temperature of free air. Gaz.prom. 10 no.5:34-36 '65.

(MIRA 18:6)

L 2629-66 EWT(1)/EWT(m)/FCC/T/EWA(h) IJP(c) GW

ACCESSION NR: AP5026238

UR/0048/65/029/010/1956/1961

61
55
B

AUTHOR: Khrimyan, A.V.; Avakyan, V.V.; Pleshko, M.P.; Vartanyan, T.G.

TITLE: Investigation of low-energy charged particles with the Cosmos 12, Cosmos 15, and Electron 2 satellites /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 10, 1965, 1956-1961

TOPIC TAGS: primary cosmic ray, secondary cosmic ray, cosmic ray shower, proton interaction, pi meson

ABSTRACT: The authors, continuing earlier work of one of them (Zh. eksper. i teor. fiz., 35, 1076, 1958), have investigated the production of showers in matter by high energy protons and pions in order to acquire data for estimating the secondary background due to the surrounding material in rocket and satellite measurements of primary cosmic radiation. The measurements were performed at Aragats at an altitude of 3200 m above sea level. The investigated protons and pions were produced in lead by cosmic ray neutrons; their momenta were determined with the aid of a magnetic field, and their ionizing powers were measured with a sequence of five gas-

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filled proportional counters. After passing through the magnetic field and the proportional counters, the secondary particle entered an "interaction hodoscope," consisting of a layer of polystyrene, three thin (~15 g/cm^2) layers of lead, and four thick (~43 g/cm^2) layers of copper, with counter trays between them. The data are presented graphically as momentum versus ionizing power plots for the particles that exhibited different specific types of behavior in the interaction hodoscope. From the data presented it is concluded that 15% of the events recorded by a detector surrounded by 10—50 g/cm^2 of heavy metal will be shower events, that the probability of producing a penetrating shower increases with increasing momentum of the initiating particle, that a pion with momentum between 0.1 and 0.7 Bev/c is from two to four times more likely to produce a shower than is a proton of the same momentum, and that it will be difficult to identify primary cosmic ray electrons or γ-rays by observing the showers they produce unless the secondary particles are identified. "The authors express their gratitude to G.V.Khrimyan for discussing the results and for valuable remarks, and to G.G.Matevosyan, E.V.Patvakanyan, G.M. Smsaryan, V.S.Truzyan, and A.A.Oganesyan for assistance with the work." Orig. art. has: 3 figures and 1 table. [15]

ASSOCIATION: none

Card 2/3

L 2629-66

ACCESSION NR: AP5026238

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SUBMITTED: 00

ENCL: 00

SUB CODE: AA, NP

NO REF SOV: 009

OTHER: 002

ATD PRESS: 4134

Card 3/3 DP

L 21968-66 EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWA(h) JD/HM

ACC NR: AP6007916 SOURCE CODE: UR/0125/66/000/002/0007/0009

47
45
B

AUTHOR: Balakin, V. I.; Khrenov, K. K.

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut elektrosvarki AN UkrSSR)

TITLE: The role of the vacuum in cold welding

SOURCE: Avtomaticheskaya svarka, no. 2, 1966, 7-9

TOPIC TAGS: cold welding, vacuum welding, gas adsorption, molecule

ABSTRACT: A new theory is offered by the authors, namely, that the principal difficulties in cold welding (extensive deformations, high unit pressures greatly exceeding the ultimate strength of the metal and considerable expenditure of energy) stem from the film of adsorbed gases at the metal surface. The old theory claiming that these difficulties are due to surface contamination by oxide and grease films is shown to be unfounded, since the removal of these films is a comparatively easy operation that does not make cold welding any easier thereby. Thus the conclusion is that the culprit is precisely the film of adsorbed gases which is normally ignored. This film is extremely difficult to eliminate, because it is almost instantaneously restored in air

Card 1/2 UDC: 621.791.1:533.5

L 21968-66

ACC NR: AP6007916

2

or in any other gaseous atmosphere. Besides, recent experiments (cf. N. L. Golego. Avtomaticheskaya svarka, no. 3, 1965) have demonstrated that metals with a surface free of an adsorbed film of gases, when present in a high vacuum of 10^{-9}-10^{-10} mm Hg, get bonded together sufficiently strongly at a pressure of only 1 g/mm^2 as compared with the tremendous pressures required in cold welding under normal conditions. The explanation for this phenomenon is that the surface atoms of metal have unsaturated outside bonds. A layer in which operate considerable forces of attraction, capturing any molecule, forms at the surface. Thus there primarily forms an extremely strong monomolecular layer in which the molecules of gas are pressed against the metal under a pressure of hundreds or even thousands of atmospheres; this layer forms almost instantaneously within 10^{-8}-10^{-9} seconds after any cleaning of the surface and it simply cannot be eliminated by any method of cleaning metals in air. Cleaning in a vacuum of not less than 10^{-7}-10^{-8} mm Hg, on the other hand, is effective and it is definitely worthwhile considering that then the quality of cold welding can be greatly improved and the required deformations and unit pressures drastically reduced. This can be accomplished on an industrial scale and hence the necessary if intricate apparatus should begin to be developed. Cold welding in the vacuum of outer space is another eventual possibility.

SUB CODE: 13, 20/ SUBM DATE: 18May65/ ORIG REF: 001/

Vacuum diffusion bonding

19

Card 2/2

L 47450-66 EWT(d)/EWT(m)/EWP(v)/EWP(t)/ETI/EWP(k)/EWP(h)/EWP(1) IJP(c) JD

ACC NR: AP6014443 SOURCE CODE: UR/0125/65/000/012/0068/0069

5 b
B

AUTHORS: Khrenov, K. K.; Bulyga, A. F.

ORG: none

TITLE: Air-plasma cutting of metals

SOURCE: Avtomaticheskaya svarka, no. 12, 1965, 68-69

TOPIC TAGS: plasma cutting, stainless steel, volt ampere characteristic, tungsten / 1Kh18N9T stainless steel

ABSTRACT: The results of tests of Ye. O. Paton's method for plasma cutting of metals with the use of inexpensive and plentiful gases are given. The apparatus has a power of about 40 kW (see Fig. 1). The tests were made with 1Kh18N9T steel (see Fig. 2). The preliminary tests showed that the use of compressed air for plasma cutting can be most economical and universal, since it competes successfully with all known methods of metal cutting. Research for increasing the power of the apparatus is being continued.

Card 1/2 UDC: 621.791.94.03

L 47450-66

ACC NR: AP6014441

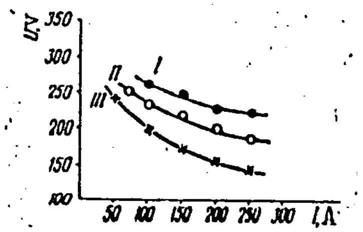

Fig. 1. Volt-ampere characteristics of apparatus. Average air consumption: I - 7 m^3/hr; II - 6.3 m^3/hr; III - 5.6 m^3/hr

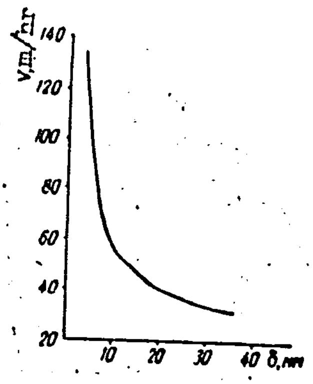

Fig. 2. Speed of air-plasma cutting of 1Kh18N9T steel, as a function of sheet thickness

Orig. art. has: 2 graphs and 2 photographs.

SUB CODE: 11, 13/ SUBM DATE: none

Card 2/2 mjs

KHRENOV L.K.

OLENEV, Nikolay Mikhaylovich; MISHIN, Boris Vasil'yevich; KHRENOV, L.K., redaktor; PERMINOV, S.V., vedushchiy redaktor; YASHCHURZHINSKAYA, N.B., tekhnicheskiy redaktor.

[Nonmetal reservoirs for storing petroleum and petroluem products] Nemetallicheskie rezervuary flia khraneniia nefti i nefteproduktov. Leningrad, Gos.naucho-tekhn.izd-vo neft.i gorno-toplivnoi lit-ry, Leningr.otd-nie, 1957. 383 p. (MLRA 10:11)
(Petroleum--Storage) (Petroleum products--Storage)

KHRENOV, L.S. [Khrienov, L.S.], prof., doktor geograf. nauk

"Atlas of the other side of the moon." Reviewed by L.S. Khrenov.
Znan. ta pratsia no.3:30 Mr '62. (MIRA 16:7)

(Moon--Photographs, maps, etc.)

KHRENOV, L.S., prof. (Moskva)

An outstanding Russian geographer and traveler; the 125th anniversary of the birth of N.M. Przheval'skii. The knight of science. Priroda 53 no.5:107-109 '64. (MIRA 17:5)

GAN'SHIN, V.N.; KHRENOV, L.S.

The most advantageous form of interpolating grid.
Izv.AN Kazakh.SSR.Ser.geog. no.2:102-105 '48.
(Topographical surveying) (MLRA 9:6)

KHRENOV, L. S.

PA 48/49T42

USSR/Geography Mar/Apr 49
Geodesy
Maps

"Review of N. V. Vinogradov's Book, 'Maps of Foreign States and International 1:1,000,000 Map of the World,'" L. S. Khrenov, 1½ pp

"Iz v-s Geograf Obshch" Vol LXXXI, No 2

Gives favorable review. Book consists of two parts: (1) Problems connected with maps made of foreign states up to World War II and (2) international 1:1,000,000 map of the world.

[redacted] 48/49T42

USSR/Geography (Contd) Mar/Apr 49

Published by Pub House for Geodesic Lit, Chief Directorate of Geod and Cartography, Council of Ministers USSR, Moscow, 1946, 184 pp, price 30 rubles, 500 copies printed.

[redacted] 48/49T42

KHREMOV, L.S.

Khremov, L.S. "Academician A.A. Grigor'yev", (Geographer. On the 65th anniversary of his birth), Vestnik Akad. nauk Kazakh. SSR, 1948, No. 11, p. 99-102, - Bibliog: "A bibliography on A.A. Grigor'yev", p. 102, with protrait.

SO: U-3042, 11 March 53, (Letopis 'nykh Statey, No. 9, 1949) nov, L. S.

Author: Khrenov, L. S.

Title: The five diget tables of trigonometric functions, containing the natural values of the six diget functions over each minute from 0° up to 360° and the values over each 10 arcs arc from 0° up to 10°. 2nd ed. (Piatiznachnye tablitsy trigonometricheskikh funktsii, soderzhaschie natural'nye znachenia shesti trigonometricheskikh funktsii cheres kazduiu mintu ot 0° do 360° i znachenia kotagensov i kosekansov cheres kazhduiu sekundu dugi ot 0°00 do 0°50 i cheres kachdye 10 dugi ot 0° do 10°.) 103 p.

City: Moscow

Publisher: State Printing House of Technical and Theoretical Literature.

Date: 1949

Available: Library of Congress

Source: Monthly List of Russian Accessions, Vol. 3, No. 7, P. 445.

CALL NO: QA55. K7

SUBJECT: 1-TRIGONOMETRICAL FUNCTIONS 2-TRIGONOMETRY-TABLES-ETC

KHRENOV, L.S.

Mathematical
Reviews
Vol. 15 No. 2
Feb. 1954
Numerical and
Graphical Methods

6-24-54

Hrenov, L. S. Semiznačnye tablicy trigonometričeskih funkcil. [Seven-place tables of trigonometric functions.] Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow-Leningrad, 1951. 415 pp. 33.75 rubles.

These tables are intended to give the astronomer a good seven-place grip on the natural values of the trigonometric functions. One third of the volume is devoted to the cotangents and cosecants of angles less than ten degrees. Here the interval is one second of arc. This is followed by a table of all six functions at the interval of ten seconds. First differences and proportional parts are given in the main table. Presumably these tables are the result of collating the tables of Gifford, Andoyer and Peters. The large page (29.1×22 cm.) allows adequate room for the main table. The printing is a little irregular but the paper is of better quality than usual. At least seven and sometimes eight significant figures are given. There are nine minor conversion tables mainly for astronomical computers.

D. H. Lehmer (Los Angeles, Calif.).

2

KHRENOV, L.S. [author]; BUTKEVICH, A.V. [reviewer].

"Seven-place tables of trigonometric functions." Astron.zhur. 30 no.4:457-458 Jl-Ag 53. (MLRA 6:8)

(Trigonometrical functions) (Khrenov, L.S.)

KHRENOV, L.S.

Nikolai Georgievich Kell'. Izv. Vses. geog. ob-va 85 no.3:303-305 My-Je '53.

(Kell', Nikolai Georgievich, 1883-) (MLRA 6:6)

KHRENOV, L.S., professor; SAMSONENKO, L.V., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor

[Five-unit tables of trigonometrical functions; containing natural values of six trigonometrical functions through 1' from 0 to 360° and the values of cotangents and cosecants through 1" from 0°00 to 1°00' and through 10" from 1 to 10°] Piatiznachnye tablitsy trigonometricheskikh funktsii; soderzhashchie natural'nye znacheniia shesti trigonometricheskikh funktsii cherez 1' ot 0 do 360° i znacheniia kotangensov i kosekansov cherez 1" ot 0°00 do 1°00' i cherez 10" ot 1 do 10°. Izd. 3. Moskva, Gos. izd-vo tekhn-teoret. lit-ry, 1954. 106 p.

(Trigonometrical functions) (MLRA 7:10)

KHRENOV, L.S., professor; SAMSONENKO, L.V., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor.

[Five digit tables of trigonometric functions with argument expressed in hours, minutes and seconds. They contain the values of six natural trigonometric functions from 0 to 24^h given with 4^s intervals. The values of cotangents and cosecants from 0^h00 to 0^h08^m are given each 0^s1 and from 0^h08^m to 0^h40^m are given each second] Piatiznachnye tablitsy trigonometricheskikh funktsii s argumentom, vyrazhennym v chasovoi mere, soderzhashchie natural'nye znacheniia shesti trigonometricheskikh funktsii cherez kazhdye 4^s ot 0 do 24^h, znacheniia kotangensov i kosekansov cherez $0^s,1$ ot 0^h00^m do 0^h08^m i cherez 1^s ot 0^h08^m do 0^h40^m. Izd. 2-e, perer. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1954. 171 p.
(Trigonometry--Tables, etc.) (MLRA 8:5)

KHRENOV, L. S.

F/W

Hrenov, L. S. Pyatiznačnye tablicy trigonometričeskih funkcii s argumentom, vyražennym v časovoi mere. [Five-place tables of the ~~trigonometric functions~~ with argument expressed in hourly measure.] 2d ed. Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow, 1954. 172 pp. 7.70 rubles.

The main table gives values of the six trigonometrical functions at interval of 4 seconds of time (i.e. 1 minute of arc), usually to 5S, in the range 0 to 3 hours. (Whenever the leading figure is unity, five further digits are given.) First differences are usually given, with their proportional parts alongside the tables. An auxiliary table, new in this second edition, gives cot x, cosec x to 5S for $x=0(.1^s)08^m(1^s)40^m$. There is a table of $\sin^2(\frac{1}{2}x)$ for $x=0(4^s)12^h$. Entries with terminal 5 are marked with ± to indicate in what direction rounding should be made. There is a collection of conversion tables, constants and formulae from plane and spherical trigonometry and there are worked examples showing the direct and inverse use of the tables. The tables are clearly printed.

HRENOV, L. S.

There are no references to sources, nor is there a description of the construction. It is stated that the entries are correct to half a unit in last place. The tables should be convenient for those who require something between the two volumes issued by L. J. Comrie [Four-figure tables . . . argument in time, London, 1931] which gives 4+ decimals at 10^s interval, and the British Nautical Almanac Office [Seven-figure trigonometrical tables for every second of time, H. M. Stationery Office, London, 1939], which gives values to 7D at 1^s interval.

John Todd

KHRENOV, L.S.

Subject : USSR/Astronomy

AID P - 854

Card 1/1 Pub. 8 - 13/13

Author : Khrenov, L. S.

[redacted]

Title : Review

Periodical : Astron. zhur., v. 31-5, 487-488, S-O 1954

Abstract : A general favorable review of the book The Technique of Calculations by Larchenko, Ye. G.

Institution : None

Submitted : No date

KHRENOV, L. S.

Tachymetric tables for the calculation of vertical and horizontal distances in working with circular tachymoters and plane-table alidades. Izd. 2., perer. Moskva, Goslesbumizdat, 1955. 247 p. (55-44248)

KHRENOV, Leonid Sergeyevich, professor; KRASNOSHCHEKOV, A.N., retsenzent;
BLUDOVA, G.M., retsenzent; SHARUPICH, S.G., redaktor; YEPISHKINA,
A.V.;redaktor; KARASIK, N.P., tekhnicheskiy redaktor

[Geodesy] Geodeziia. Moskva, Goslesbumizdat, 1955. 510 p.(MLRA 8:11)
(Surveying)

KHRENOV, L.S., professor.

Instruments for surveys in connection with irrigation and drainage. Gidr. i mel. 8 no.6:24-32 Je '56. (MLRA 9:9)

(Surveying--Instruments)

KHRENOV, L.S., prof.; GAN'SHIN, V.N., dotsent

Theoretical and practical problems in surveying for industrial construction purposes ("Surveying in industrial construction" by B.I.Gerzhula. Reviewed by L.S.Khrenov, and V.N.Gan'shin). Izv. vys.ucheb.zav.; geod.i aerof. no.4:123-128 '59. (MIRA 12:10)

1. Moskovskiy institut inzhenerov vodnogo khozyaystva (for Khrenov). 2. Stalingradskiy institut inzhenerov gorodskogo khozyaystva (for Gan'shin).

(Surveying) (Gerzhula, B.I.)

GAN'SHIN, Vladimir Nikolayevich; KHRENOV, Leonid Sergeyevich;
BARINOV, V.A., red.; FUKS, Ye.A., red.izd-va; SHITS, V.P.,
tekhn.red.

[Tables for laying out circular curves] Tablitsy dlia razbivki krugovykh krivykh. Moskva, Goslesbumizdat, 1958. 258 p. (MIRA 13:1)

(Surveying--Tables, etc.)

KHRENOV, Leonid

KHRENOV, Leonid Sergeyevich, prof.; BARINOV, V.A., red.; SVETLAYEVA, A.S., red.izd-va; BACHURINA, A.M., tekhn.red.

[Tables for barometric leveling] Tablitsy dlia barometricheskogo nivelirovaniia. Izd.2-oe, perer. Moskva, Goslesbumizdat, 1957. 27 p. (MIRA 11:1)

(Leveling--Tables, etc.)

PHASE I BOOK EXPLOITATION 713

Khrenov, Leonid Sergeyevich, Professor

Malyye vychislitel'nyye mashiny; kratkoye spravochnoye rukovodstvo (Small Calculating Machines; Brief Reference Manual) Moscow, Gostekhizdat, 1957. 154 p. 20,000 copies printed.

Ed.: Lapko, A.F.; Tech. Ed.: Brudno, K.F.

PURPOSE: This book is intended for calculating machine operators employed in various branches of the Soviet economy.

COVERAGE: The book describes various types of small calculating machines, and gives brief information on their construction and methods of operation. The author thanks T.A. Byzov, Chief Engineer of the division of automation, telemechanics and computation engineering of Politekhnicheskiy muzey (Polytechnical Museum) for his help in preparing the book. There are 42 references, of which 41 are Soviet and 1 English.

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Small Calculating Machines (Cont.)

713

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AVAILABLE: Library of Congress

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GO/ksv
11-12-58

KHRENOV, Leonid Sergeyevich

Malyye vychislitel'nyye mashiny; kratkoye spravochnoye rukovodstvo. Izd. 2., dop. Moskva, Fizmatgiz, 1958. 183 p. illus., diagrs., tables.

Bibliography: p. 181-182.

AUTHOR: Khrenov, L.S., Professor

98-58-4-15/18

TITLE: Conference Pertaining to Geodetic Methods of Observing Deformations of Hydro-Technical Installations. (Soveshchaniye po geodezicheskim metodam nablyudeniy za deformatsiyami gidrotekhnicheskikh sooruzheniy)

PERIODICAL: Gidrotekhnicheskoye Stroitel'stvo, 1958, 27 Nr 4, pp 58-60 (USSR)

ABSTRACT: The sections of geodesy, aerial photography and cartography of Soviet universities held a conference in Moscow. The conference was attended by more than 200 geodetists, hydrotechnicians and geologists. A total of 16 reports and 25 speeches was given. The first report was made by Engineer M.M. Sokol'skiy of "Gidroproyekt" on the subject "Deformation of Hydroelectric Installations and the Nature and Methods of Their Calculation". He recommended dividing geodetic observations into 2 categories - control observations and detail observations. The report "Aims and Basic Principles of Developing Programs of Geodetic Research into Deformations of Hydrotechnical Installations" was made by Professor N.N. Maslov (Leningrad). Professor A.I. Durnev of MIIGAK, gave a report on the subject "Organization of Basic Geodetic Work

Card 1/4

Conference Pertaining to Geodetic Methods of Observing Deformations of Hydro-Technical Installations

98-58-4-15/18

on Large Hydrotechnical Installations". Durnev proposes to install on construction site a geodetic network of high accuracy, called frame-net-work, to obtain at certain control points accurate readings on any deformations. Dotsent M.S. Muravyev of the same institute, reported on the "Observations by Geodetic Methods of the Deformations of the Tsymlyansk Hydrotechnical Installation". A detailed description was given of the methods, instruments, and equipment used in connection with alignment observations at this installation. M.Ye. Piskunov of the same institute reported on the "Experience Gained From Observations Concerning Sagging of the Tsymlyansk Hydrotechnical Installation". This report gave a detailed description of the instruments and methods employed in leveling. It was found that sagging was greater in the winter than the summer when a certain amount of rising was observed. Engineers S.P. Sidel'nikov and O.A. Ponamarev of the Kuybyshev Hydroelectric Power Plant reported on the vertical and horizontal shiftings of their installation. Candidate of Technical Science M.V. Korotkov (Leningrad) of

Card 2/4

98-58-4-15/18

Conference Pertaining to Geodetic Methods of Observing Deformations of Hydro-Technical Installations

the All Union Science and Research Institute of Mining Survey reported on the shift of the earth's surface under the influence of mining. Engineer A.I. Ulitin reported on "Improvements of Methods of Ibservation of Horizontal Shifts of Concrete structures at the Kekum Hydroelectric Power Plant". Dotsent M.S. Muraviyev reported on "Rational Methods of Establishing Horizontal and Vertical Bases for Geodetic Investigations of Large Hydrotechnical Installations". Engineers M.I. Gorstein and N.M. Parovoznikov (of the Kakhovka Hydroelectric Power Plant and Ukrainian branch of Gidroenergoproyekt, reported on "Results Obtained From Observations of the Sagging and Horizontal Shifts of the Installations of the Kakhovka Hydroelectric Power Plant". The methods proposed by Muravyev were elaborated by Gorstein. Engineer L.F. Zlatoverkhovnikov of the Central Science and Research Institute of the Navy reported on "Results of Observations of General Deformations of Hydrotechnical Installations at Seaports". Engineer M.E. Plakida of the

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98-58-4-15/18

Conference Pertaining to Geodetic Methods of Observing Deformations of Hydro-Technical Installations

Central Science and Research Institute of Water Transport, reported on the "tide" landing piers in France and the task of constructing similar installations in the USSR. Engineer Ulitin reported on the organization and methods of geodetic work in connection with the rising of the foundation pit of the Narva Hydroelectric Power Plant during the period of construction. Engineer Bombchinskiy of Gidroproyekt reported on the "Determination of Horizontal Shifts of Hydrotechnical Installations of the Kuybyshev Hydroelectric Power Plant" by means of a new method. Engineer Dureyko of the Moscow Engineering Institute of Geodesy reported on the "Application of a New Engineering Instrument, Used in Connection With Alignment Observation". The instrument was built by Dotsent V. A. Belitsyn. Engineer Knyazev of Gidroproyekt reported on "Geodetic Observations of the Installations of the Kuybyshev Hydroelectric Power Plant". The conference decided to establish an all-union information and coordination center to study and collect information on methods and instruments used in these fields.

AVAILABLE: Library of Congress

Card 4/4

1. Dams-Deformation-Measurement 2. Mining engineering 3. Electric power plants 4. Geodetics-USSR

KHRENOV, Leonid Sergeyevich; LAPKO, A.F., red.; GAVRILOV, S.S.,
tekhn.red.

[Small calculating machines; brief reference manual]
Malye vychislitel'nye mashiny; kratkoe spravochnoe
rukovodstvo. Izd.2., dop. Moskva, Gos.izd-vo fiziko-
matem.lit-ry, 1959. 183 p. (MIRA 12:7)
(Calculating machines)

28(2)

SOV/25-59-2-34/48

AUTHOR: Khrenov, L.S., Professor

TITLE: Miniature Calculating Machines (Arifmometry-liliputy)

PERIODICAL: Nauka i zhizn', 1959, Nr 2, p 73 (USSR)

ABSTRACT: The author describes the portable miniature calculating machine "Kurta" manufactured by the firm "Kontina" in Liechtenstein.

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